

its Transparency : To remedy which, I found it necessary to prolong that Side of the Cap that was before the Eyes, and thereby enlarged the Prospect of what was under us.

V. *An Account of an Aurora Borealis, observed at Dublin, on Monday the sixth of February, 1710-1.* By J. W.

THE *Royal Society* having done me an unexpected Honour, in causing a short Account, which I sent 'em of the *Aurora Boreales*, that were seen the 10th and 24th of *November*, in the Year 1719, to be printed in their Journals ; I now present them with an Extract of what was observed on *Monday* the 6th of *February* last. The Air was all that Day, as it had been for some time before, very clear and sharp ; about half an Hour past four in the Evening, some flying Clouds appear'd, and the sky was ting'd with a very unusual yellowish Colour, which perhaps might be reflected from a great Quantity of Snow, that soon after fell for near a quarter of an Hour. However that might be, I'm willing to date the beginning of the ensuing *Phænomena* from the first appearance of this uncommon Light. About a quarter past six, a thin Vapour, which was as yet very ill defin'd, and in all appearance resembl'd an exceeding black Cloud, had fix'd it self in the Northern *Hemisphere* ; its Edges were ting'd with a reddish Yellow, that by degrees, as it approach'd the
Vertex,

Vertex, grew more dilute, till at last it ended in a faint Whiteness. That in reality it was no Cloud, but only a Vapour exceeding pure and limpid, was manifest, because several of the fix'd Stars shone thro' it, without having their Light in any degree effac'd. In the midst of this dark *Basis*, about half an Hour past six, a lucid *Area* shew'd it self due N. East, about 35 deg. above the *Horizon*, and in less than a Minute from the time I first discover'd it, emitted a very large *Pyramidal* Stream of shining Vapour, which with an incredible Swiftnefs ascended obliquely towards S. S. West, so as to leave the *Zenith* considerably to the Westward, and very soon after, about the same Place, six others arose at the same instant almost to the *Zenith*. From this time till 48 Minutes past six, we had repeated Projections of these lucid Rays, without any order as to Time, Place, or Magnitude. They did not only arise from behind the dark *Basis*, but sometimes as it were out of the pure Sky; and tho' some of them continu'd visible more than a Minute, yet the greater part of them only just shew'd themselves and died away. I had now got to the Top of a convenient Observatory, where (though destitute of Instruments) I had a free Prospect of the *Horizon*; and in company of another Gentleman, fix'd my self with great Attention, to expect the ensuing *Phases* of this *Phænomenon*.

About 6 h. 55 m. between N. W. by North, and W. N. West, we found the Representation of a very bright *Crepusculum*, such as that which appears about 20 Minutes after Sun-set; from which arose several very large Beams of Light, not exactly erect towards the *Vertex*, but somewhat declining to the South;
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among these, one which arose about N. West, and in three or four second Minutes pass'd over 50 or 60 degrees of a great Circle, was above all others that had preceded, the most splendid: Its sides were inclin'd to each other with an Angle of about 8 or 10 Degrees, and were ting'd with a brisk lively Red, which by degrees, as it approach'd the *Axis*, became more intense and dirty: On the other hand, receding from the *Axis*, its Colour was a pale Yellow, that soon lost it self in a faint Whiteness.

From this time no Moment pass'd without such Variety of different *Phases*, that it was impossible for the Eye of any single Person to pursue it thro' the suddenness of its Alteration. While some of the lucid Beams seem'd to stand fix'd, as it were, among the Stars, others mov'd slowly from East to West, by which they seem'd to meet each other, sometimes to recede from each other, and sometimes by a kind of apposition, great ones were produc'd from others of an inferior order.

The lucid *Area*, which I first discover'd in the N. East, had now form'd it self into a *Parallelogram*, whose upper and lower Edges were 5 or 6 Degrees distant from each other, and nearly parallel to the *Horizon*: In this, as if behind a Curtain, vast Waves of Light, whose Extremities did not reach the *Periphery* of the dark *Basis*, seem'd to meet and pervade each other; at other times, while some of 'em, with a remarkable Velocity, mov'd Eastward; others, as if behind them, would fly towards the West; by which variety of different Motions, as often as any Interval pass'd between the Collision of these erect Waves, a beautiful Undulation was produc'd, and its Pulses, by the adjoyning Parts of the Fluid, were propagated to a vast distance.

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While we stood amaz'd at this surprizing Sight, the *Axis* of the colour'd *Pyramid*, which arose in the N. West, had mov'd considerably toward the West, and at 7h. 25m. was about 23 or 25 Degrees to the North of *Venus*. The dark *Basis* of this Meteor had now extended almost to the East Point of the *Horizon*, and at half an Hour past seven, between E. N. E. and E. by N. several large Columns ascended in an instant to the *Zenith*; the most Eastward whereof was remarkably convex toward the South, and ting'd with a pale Red, as were most of those which ascended with it. They were met by others, that arose at the same time between the North and West, and in the *Zenith* form'd a vast Collection of Vapour, that pretty much resembl'd Smoke inlightned by the Sun's Beams; its Waves reflected a brisk, lively red Colour, and in some places a pale Yellow; they roll'd indifferently any way; and in little more than a Minute, when the first Efforts of their Congress were spent, and all seem'd fix'd and serene, the *Corona* projected several small Rays, which with a slow uniform Velocity descended between W. by N. and N. W. soon after which it died away.

We had not much time to lament the Absence of our *Spectrum*, for at 7 h. 40 m. several other *Striæ* were discharged from behind the dark *Basis*, which intersecting with others, that at the same time arose about the East and West Points, form'd in the *Zenith*, or rather 6 or 8 Degrees to the South thereof, a second much more elegant and surprizing than the former, and indeed than any thing that had yet appeared: it was not only ting'd with different Orders of red and yellow, but also with blue and violet, the last of which, by a Mixture with the white Light, appear'd

appear'd faint and inclin'd to Purple. Tho' the Vapour, of which this and the preceding *Corona* were form'd, was so exceeding thin and pure, that several of the fix'd Stars were visible thro' it, yet it reflected a Light so copious, that I could thereby perfectly distinguish the time of night by a small Gold Watch. While thus delighted, our *Phænomenon* ejected four or five large Columns toward the N. W. (besides others toward the South) which appear'd pointed at the Top, and their Sides inclin'd to each other with an Angle of 5 or 6 Degrees. When their Bases were extended about 30 or 35 Degrees from the *Vertex*, the lower Parts of two or three of 'em broke, as it were, by the meer Weight of the Vapour, separated from the upper, and descended with a slow Motion, in the Form of truncate Cones: they were gradually follow'd by their upper Parts, and in about a Minute were lost in a large Body of Light that was settl'd between the N. W. by N. and W. N. W. The *Corona*, as if exhausted by these great Discharges, became immediately more dilute and languid, its lively Colours faded, and were succeeded by a whitish vibrating Light, that in less than two Minutes intirely disappear'd.

The dark Vapour, which continu'd to possess the Polar Regions, had now extended it self from the East to the N. W. by N. point of the *Horizon*, and was form'd in a large Segment of a Circle, whose Center was about 20 Degrees below the *Horizon*; its upper Edge was ting'd with a pale Red, which was soon lost in a florid Yellow, and this again, as it approach'd the *Zenith*, became more effete and languid. In this dark Segment several lucid *Areas* frequently discover'd themselves, with a vibrating Light, which instantly disappear'd, as if a Curtain were drawn over them;
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and from it Rays of very different Magnitudes continu'd to ascend without any Uniformity as to time and place, till 48 or 49 minutes past seven, when a third *Corona*, very little, if at all, inferior to the preceding ones, either in the Variety of its Colours, or in the quantity of Light it emitted, was form'd in the *Zenith*. As the preceding were both produc'd by the Northern *Striæ*, so this was augmented by two or three large ones, that arose due South, out of the pure Sky, and were, in all probability, part of the Vapour, which had been projected beyond the *Zenith*, or which had subsided from the two former : they caus'd the Vapour, of which this Image was compos'd, to move with great Violence, in different Directions, not unlike Waves of Smoke, confin'd in a reverberating Furnace ; this Motion being abated, the Vapour acquir'd a kind of Stagnation, in which State it continu'd but a very short time, before it projected several lucid Beams, (an inevitable Fore-runner of its approaching Dissolution,) between the North and West, and soon after, pardon the levity of the Expression, *Nocti se immiscuit atra*.

About this time, the great Beam, which arose in the N. W. and had preserv'd its Colours in their original Beauty, for more than three quarters of an hour, began to fade, and at 7 h. 53 m. was absorb'd in a vast body of Light, which seem'd fix'd in that part of the *Horizon* : it had mov'd in that time 15 or 20 degrees to the Westward of the Place from whence it arose. The *Impetus* of the Vapour being now pretty much abated, we had nothing extraordinary but successive Discharges of pointed Rays between the N. West, and E. N. East ; without any Order

or Uniformity as to time or place ; setting aside these, there was very little difference in the general face of affairs for 20 minutes ; neither had we much reason to hope for any, because the severity of the Cold was such, that it oblig'd us to remove to a better Climate, and by that means we unfortunately lost the ensuing *Phases* of our dying *Meteor*.

Dublin, June
28th. 1721.

I am, &c.
J. W.

VI. *A Description of an Aurora Borealis, seen on the same Day at Cruwys-Morehard, in Devonshire. By Samuel Cruwys, Esq; F.R.S.*

MOnday the 6th of Feb. 1720-21, a little before 7 in the Evening, there arose out of the North, or a little towards the East, a bright *Crepusculum*, which soon spread it self a great way through the Northern part of the Hemisphere. About 7 (when I first saw it) it began to leave behind it, at due North, or a few Degrees to the East, part of a very clear Sky (which look'd like a black Cloud, but the Stars shone in it clearly) being a Segment of a Circle, into which Figure, the *Crepusculum* (or expanded Body of lucid Vapour) had now formed its upper Limb also, making a kind of broad *Iris*, terminated at each end by the Horizon.